DOCUMENT RESUME

ED 310 988 SO 020 226

AUTHOR Brown, Evan L.
TITLE A History of Psychology.
PUB DATE 89
NOTE 48p.
PUB TYPE Historical Materials (060) -- Viewpoints (120)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Behaviorism; Bias; *Experimental Psychology; *Historiography; History; *Psychologists; *Psychology
IDENTIFIERS Boring (Edwin); Empiricism; Functionalism; Rationalism; Structuralism

ABSTRACT

Any study of the history of psychology must first determine what is to be considered psychology, whether to stick to the relatively continuous Western tradition or to include others (e.g., Eastern, Oriental), and whether to investigate the impact of the socio-cultural events of the time on the views of that period or consider those views in a vacuum. The dominate text in the field, Boring's "A History of Experimental Psychology," tends to focus on events leading to the introduction of the experimental method and on the events leading to the development of Boring's teacher's views. Other histories also tend to be internal histories and do not venture far into other disciplines or pre-18th century viewpoints on the mind and mental activity. Western psychology can be divided into three main phases. Phase 1 starts with Aristotle, runs through the 16th century, and is dominated by Aristotle and reactions to his writings--what could be termed theoretical psychology. Phase 2 covers the 17th century through the late 18th century. This period of mental philosophy is typified by debate between the rationalists and the empiricists, which is reflected in our time by the debate over innate versus learned behavior and thought. Phase 3 is the result of the introduction of the experimental into the study of the subject matter of phase 2, which led to structuralism, functionalism, and behaviorism. A chart showing the relationship among areas of psychology with time periods, and areas of psychology with schools of psychology is included. (PPB)

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A HISTORY OF PSYCHOLOGY

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ABSTRACT

There are so many histories of psychology. There are so many ways to teach histories of psychology. Hermann Ebbinghaus, the pioneering worker on memory, said "Psychology has a long past, but only a short history." This partial past or history of psychology (by the late Evan L. Brown) focuses on "Western" psychology, beginning with Artistotle and proceeding to the twentieth century.

FOREWORD

Herr, Doktor, Professor Evan L. Brown, Ph.D., died on May 25, 1988. He was a valued and honored colleague. He was not only a scholar, but a renaissance man. We discovered one of his unpublished manuscripts and are having it published posthumously. The manuscript is in three parts: (a) notions on teaching a history of psychology; (b) a chart interacting areas of psychology (e.g. senses...motivation) with time periods (e.g., classical/medieval..19th century), and areas of psychology (e.g. senses...motivation) with schools of psychology (e.g., Structuralism...Gestalt); and (c) a sketch of a history of psychology (Aristotle to modernity).

This publication should be very helpful to teachers and students of the history of psychology. Evan's modern focus is on Structuralism, Functionalism, and Behaviorism. He did not complete the manuscript. Dr. Kenneth A. Deffenbacher (Professor and Chair, Psychology) and I are assuming responsibility for the publication, in memorium.

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TABLE OF CONTENTS

Page

Notions on Teaching A History of Psychology 5

A Chart Interacting Areas of Psychology With Time Periods, and Areas of Psychology With Schools of Psychology.....13, 14

A Sketch of A History of Psychology.....15

Phase One.....16

Phase Two.....19

A Scientific Prelude to Phase Three.....24

Phase Three.....31

Early Phase Three: Wundt, Titchener, et al; Structuralism.....32

Functionalism.....38

Behaviorism: J.B. Watson, His Followers and Predecessors.....44

NOTIONS ON TEACHING

A HISTORY OF PSYCHOLOGY

The exact content to be covered in a course of this title is somewhat difficult to determine. There is first the question of what time periods to cover, when to start and when to finish, and second the question of what countries to include, whether to stick to the relatively continuous and homogeneous 'Western' tradition or whether to attempt to include various other, for the most part separate, traditions. Further, as in any history there is the question as to whether one is to attempt an 'internal' or an 'external' approach, that is whether one is to consider scientific and prescientific views on psychological matters in a vacuum, relating each to each, or whether one is to attempt to relate them to other events of the time. (As an example of the latter, there is the suggestion that Wundt may have changed his professional affiliation from physiology to philosophy--with emphasis on what he called 'physiologische Psychologie'--because of a poorer job market in the former area.) Finally, and most basically, there is the question as to what is to be considered to be 'psychology'. In the twentieth century this is not too much of a problem, though we should note that Freud was not a psychologist professionally, but a neurologist turned psychiatrist. Also, in the nineteenth and eighteenth centuries, there is a degree of agreement at least as to what 'psychology' means. But prior to that time the term is not in common use. (In English it was probably first used about 1692, though it appears to be used earlier in Latin. Watson (p. 140) attributes it to Melanchthon in the sixteenth century.) Are we in these earlier periods to restrict ourselves to writings of persons generally regarded as philosophers or are poets, theologons, physicians, or miscellaneous scholars to be considered as well? In those writings, are we to consider only those in which the 'psyche' is discussed or are we to range more widely to include, say, material concerning optimal forms of government for its relevance to social psychology, discussions of education for its relevance to educational psychology and developmental psychology, or remarks about the influence of humors and planets on temperament for their relevance to abnormal psychology and

personality theory?

Edwin Boring had dominated the history of the histories of psychology. From the first edition of his main text in 1929 until his death in 1968, Boring had been psychology's preeminent historian, and even histories written by others show his influence. Boring's widely imitated answers to the above questions were the following: He restricted himself to the period from the renaissance to 20 years before whenever he was writing. He particularly emphasized the late nineteenth and early twentieth centuries and wrote solely on the western tradition. His history is almost entirely 'internal', as is almost inevitable since sound external history requires earlier work on the history of the ideas themselves. More important than any of these restrictions perhaps is Boring's restriction on content. He terms his main work 'A History of Experimental Psychology' and the adjective is important. Not only does Boring deal primarily with those content areas we now call experiments--perception, learning, memory, physiological psychology, etc.--but in discussing earlier periods, he tends to focus on events leading to the introduction of the experimental method in psychology. To a fair extent what Boring did was to emphasize the events leading to the formation of his major teacher's view and those of his major teacher's major teacher, and then to present the views of others largely as developments, reactions, or by way of contrast to those views. As both of these persons were quite pivotal in the introduction of experimentation into psychology, this is not so narrow minded as may at first appear and Boring's treatment of the period from 1850 to 1930 is at worst one of the best we have. However from it and from the histories it has influenced, we could well get the impression that the pre-experimental psychology of the mid-nineteenth century was concerned solely with the topics which turned out in the late nineteenth century to be particularly easy to experiment upon. It was not. As psychology became experimental, one topic of some importance, for instance, was reaction time--presumably because it was easy to measure, at least to the thousands of a second.

Emotions on the other hand were, apart from elementary dimensions of feeling, such as pleasantness, rather difficult to deal with experimentally and were consequently ignored. In the middle nineteenth century the relative importance of these topics was reversed. Alexander Bain in the 1868 edition of his Mental Science (a very widely used text at the time) devotes a quarter of his pages to the emotions and none that I can find to reaction time. From Boring's History the only indication we might get that Bain was concerned with emotions (as well as with the topics of later experimental interest) is from the title of one of Bain's books. In speaking to historians I have described this course and others of the same name as the study of the anticipations of currently fashionable fads. For Boring I must revise that estimate. His is the study of the anticipations of fads fashionable while he was a graduate student--and the later development of those fads, of course.

What of the other histories; how do they construe their subject matter? First it should be noted that all of the fairly general histories of psychology of which I am aware devote themselves to the internal history of Western psychology. The closest we get to exceptions are with the Murphys. Gardner and Lois Murphy have produced a book on traditional Asian Psychology. Further, while this Asian interest does not show in the Historical Introduction to Modern Psychology, by Gardner Murphy and Joseph Kovach, this latter book probably attempts the most in terms of external history (still not very much) and is the bravest at describing relatively recent events--most others prefer to stop as Boring does, roughly 20 years before the date of writing. The Introduction also has the virtue of greater breadth of content; both in dealing with the nineteenth century and the twentieth it includes materials on content areas that did not prove tractable to experimentation as it was first used in psychology as well as on the ones that did. Against that book is the fact that It like Boring's one starts with the Renaissance and, perhaps more importantly, students who have read it have claimed that it covered too many views in too little detail.

Perhaps the best of the histories of psychology and certainly the cheapest of the full-size ones is Robert Watson's The Great Psychologists. While Watson shares with all of the texts the tendency to focus on the writings of philosophers rather than, say, poets--what Burckhardt termed 'theoretical psychology--and while he is somewhat less external and somewhat less detailed in the recent period than are Murphy and Kovach, he has dealt much more fully with early periods of psychology and is the most aware of recent research by historians in the history of science and of ideas. As to the readability of his work, that will be for you to decide.

Unfortunately all of these books restrict themselves in the earlier period at best--as do the other texts on the history of psychology which I have not named--to writings which at that time would have been considered psychological. They consider in the ancient and medieval period primarily works on the psyche (anima) and in the period form the seventeenth century on they consider primarily works of mental philosophy or psychology as the word was then construed. From the standpoint of describing a continuous tradition and this continual transformation this is certainly legitimate and does, for the most part, present the actual historical influences. However for the psychologist or student of psychology whose interests fall outside of those bounds this must be a frustrating and to some extend a misleading procedure. Consider the question of individual differences in personality, character, temperament, what have you. Speculation on the nature and origin of these differences was not lacking in earlier periods, it was merely not part of the philosophy of mind, the study of the psyche, not part of psychology. To present the small amount which Watson has on temperament and its variation as it was viewed in classical Greek writing, he has to go outside of the philosophical tradition to Galen and his writings on the four humors. Galen was a physician by profession.

If we wish to include the histories of all the topics which are currently regarded as psychological, we must go beyond the early psychologies and their synonyms to include

material from other areas. For physiological psychology we must include material from medicine and physiology--this is usually done, because of the important influence of physiology on the introduction of experimentation into psychology. For developmental psychology we must turn particularly to writings on education, and to speculation on 'the age of man'. Motivation is discussed in many places, but it is particularly of concern in political and economic philosophy. Here we may even find the same philosophers writing as wrote on mental topics, but with their views on motivation ignored as not part of their psychology. Watson does often catch this material, but you would not learn of Hobbes' hedonism or the Utilitarianism of the Mills from all of the histories, and while you do learn of it from Boring, it is in a chapter that is sort of an after thought, a sort of appendix, which was not in his first edition. Emotion was part of the pre-experimental psychology's subject matter, so it does get some discussion. However one would not get from the histories a full feel for the classifactory complexity achieved in this area, nor would one ordinarily learn of treatments of emotion outside of mental philosophy. Of the three main American texts, only Murphy mentions Robert Burton's thorough Anatomy of Melancholy. Sensation and Perception receive the best treatment since these areas were not only part of the earlier psychology but were the first areas to receive experimental treatment. Learning and memory receive mixed treatment. The various doctrines of association are nicely considered; however as the artificial memory, the study of memory aids, was not part of the philosophy, but had its roots in rhetoric, it is not discussed. Personality theory, Abnormal Psychology, and the study of individual differences more generally have roots in medicine, in literature, in astrology, in geography, and in antrophology, to name a few. Social psychology is in part of portion of rhetoric early on and also turns up in social philosophy. After sociology comes on the scene, it of course has a particularly important history there. And of course views on what would now be educational psychology were being expressed in works on education and in Utopian writings

from Plato's Republic on.

Unfortunately for students in this class I am not very knowledgeable about the material discussed in the last two pages. My own main content areas of concern, perception, memory, and cognitive processes generally have been fairly decently dealt with by the major histories of psychology and while I have educated myself with regard to what is probably their biggest gap within that content, the artificial memory, I have not gone much beyond that. In fact though I have taught the course some three or four times, I only recently became aware of the fact that there was a problem. One possible solution to the problem is for the class to write a text on the history of the various problem areas not construed as psychology. That is to divide up the uncharted territory as much according to individual interests as possible and then to attempt to map it.

For other reasons I have been preparing an overview of the history of psychology as fairly generally construed. When this is available, it may facilitate mapping of the terra incognita by providing a known path through it. Otherwise, I can be of use in providing bibliographical aid--I think I can find out what the major sources are likely to be even though I haven't read them. As a further aid I have prepared a sketch of a map of the charted territory, though in many places I was tempted to write, 'Here be their dragons', where I suspected that somebody might have thought something to be psychological.

The chart shows an essential agreement of classical and medieval terminology, which is scarcely surprising since the higher middle ages utilized the classical texts, particularly those of Aristotle. I didn't chart the Renaissance, but it is similar. With the 17th century we get a new beginning and a shrinkage of topics--while the 17th century writers of mental philosophy might have accepted the topics dealt with earlier as psychic, they didn't tend to treat them or to treat with them that way. Following the 17th century there is a continual expansion within mental philosophy. When the experimental method is

introduced however with Wundt and friends--here termed structuralists, though that is a later term--there is a considerable shrinkage again. Functionalism shows a broader pattern and then early behaviorism and Gestalt psychology are somewhat narrower. If the chart were continued, there would be expansion again, particularly after the second world war.

Considering the popular view that psychology is concerned primarily of exclusively with personality theory, abnormal psychology, individual differences of a was studied in the late 19th and early 20th centuries particularly be some people who might be loosely called functionalists--I had to bend the chart a little here--and later by some associated with behaviorism, the activity here was by no means as great as in the study of the senses. As for the other topics, one really has to scratch to dig up anything--unless of course one is willing to deputize psychiatrists! The activities the person in the street attributes to psychologists, those actually of clinical psychologists, are large the result of the second world war and though they do now constitute a major part of psychology, they are as important areas the most recent.

A CHART INTERACTING

AREAS OF PSYCHOLOGY WITH TIME PERIODS, AND

AREAS OF PSYCHOLOGY WITH SCHOOLS OF PSYCHOLOGY

Roughly What Would Have Been Included in the Study of the Psyche, in Mental Philosophy

Or in Psychology, at Various Points in Time and Place

	Classical/Medieval	17th Cent.	18th Cent.	19th Cent.	Struc.	Func.	early Behavior.	Gestalt
senses	X	X	X	X	X	X	some	X
memory & learning	X	?	X	X	X	X	learning	some
higher cognitive	?	X	X	X		X		X
physiological	a little, but was confused and imagined			X	X	X	X	hypothetical
mind/body problem	X	X	X	X	some	some more		X
emotions	X	very little	more	X	very little	more	more	very little
will & action	X	very little	more	X	react. time	some	action	
freedom/determinism Q.	X	X	X	X		some		
immortality Q.	X	X	X	?				
personality						?self?		
individual differences						X	X	
comparative	Aristotle			?		X	X	X
social				attitudes (in emotion)				
educational						?	X	
industrial						a little, maybe		
developmental						X	X	X
motivation				X		X	X	

Note that this does not mean that there was no discussion of the topics where there are blank spaces, but that this discussion--if any--would not have been psychology and is not well covered in history of psychology texts. Individual differences were a perennial topic for instance.

A SKETCH OF

A HISTORY OF PSYCHOLOGY

I tend to divide the history 'Western' psychology into three main phases. The first phase (Phase one) starts with Aristotle and runs through the sixteenth century and perhaps later. (There is of course an earlier, pre-Aristotelian phase, phase zero.) In addition to numerous other writings, Aristotle produced in the fourth century B. C. (that is, the century running from 400 B.C. to 300 B.C.) a work On the Psyche (This is usually translated as 'On the Soul', however a brief examination shows that Aristotle's psyche has little resemblance to the Christian concept of a soul--a matter of some moment a few centuries latter.) and a series of short treatises on the senses, memory, dreams, etc. (The title usually given these is also misleading: 'Short Physical Treatises' is more satisfactory once you realize that for Aristotle 'physis' meant nature and that for him man was a part of nature.) These two sets of works by Aristotle are the first to deal with what we might call psychology in a systematic, self-contained manner. Earlier writings, such as those of Plato, may include psychological asides or may deal with some few items or psychological interest much as one finds such asides and dealings in the writings of non-psychologists today; however they are not organized into a systematic expression of views. Nor do they, the works of Plato included, strike me as having anywhere as much insight into the psychology of man.

Following Aristotle in this phase, psychology, at least theoretical psychology, is largely derivative, that is based on and commenting on Aristotle, Plato, etc. Two main independent early sources are the continued research by followers of Aristotle at Alexandria in Egypt and the writings of the Christian church fathers. As Watson makes clear, the Alexandrians are followers of Aristotle in that they continued his methods (of naturalistic observation for instance) rather than in showing complete agreement. There are some amusing passages in the writings of Galen (second century A.D.) in this regard where he argues that the most important of Alexandrian physiologists, Erasistratus, could not have been a follower of Aristotle because he disagrees on many points with Aristotle

as well as other classical writers. Erasistratus he says adopts many ridiculous positions in contrast to authority, such as for instance the belief that urine does not enter the bladder in the form of a vapor, but rather as a liquid! Unfortunately the Alexandrian research institute was not particularly concerned with psychology. Even more unfortunately most of the records of their research--in many areas the best until the seventeenth century--were destroyed, first by early Christians and the remainder (perhaps accidentally) by early Moslems.

Of the psychological views of the early Christian Church Fathers perhaps the most important and most influential were those of St. Augustine (fourth century and most obviously A.D.). These were not at all detailed and were, as with all of the surviving writings prior to the high middle ages--Aristotle aside--Augustine's psychological views are scattered throughout his other ones. Nonetheless in the period until the high middle ages they were influential.

In the late twelfth and in the thirteenth century, a revival of learning occurred in Europe, though there were sporadic pockets earlier. (The middle ages are a period of relative uncertainly for historical scholarship. It is not at all unusual today to still find people who presume that they were one big monolithic era of Christian dogmatism, a period of Dark Ages for science, truth, and beauty, miraculously ended by the big bang of the Renaissance. Nowadays for the historically knowledgeable, the thirteenth century at least has been granted some light. Perhaps in a few decades we will have to worry about Hiberno-Saxon and Carolingian psychology as well!) This revival involved particularly the writings of Aristotle which at that time became available from Arabic sources along with the commentaries of various writers, notably the twelfth century Arabic physician, Averoës. Now Aristotle's writings were quite extensive on many subjects (with those on psychology representing but a small part) and with his treatments often being the most detailed available. It was necessary therefore to take him seriously. However as noted

above Aristotle's psyche was not very similar to the Christian concept of a soul and (I think) a fair reading would have Aristotle denying the possibility of personal immortality. In any case this was Averoes' interpretation. The problem therefore for the scholastics of the thirteenth century was, primarily, to resolve this and other discrepancies among authorities, Aristotle, other Greeks, the Bible, the Church fathers, etc. This remained the primary problem for the following three centuries as well in-so-far as psychology was concerned. The last half of the fifteenth century together with the sixteenth century represented a considerable flowering in the humanities, in art, music, and literature. In was also a period of exploration, of technological innovation, and of religious conflict. (This last is particularly true of one allows the period to include the Protestant Reformations of the sixteenth century, but it is true to a fair degree for the fifteenth century as well.) For the 'theoretical psychology' as Burckhardt terms it in his Die Kultur der Renaissance in Italien there is little renaissance. True the commentators are paying more attention to Plato and to Roman writings as well as the writings mentioned above. True there is more of a concern with the individual. But the concern as before is mainly a looking back and an attempt to reconcile and sort-out authorities. True the sixteenth century has its departures from this program, its Machiavellis and Melanchthons; but then the thirteenth had its Roger Bacons and Peters of Spain.

The period then which I have called phase one, the period ranging from the fourth century B.C. through the sixteenth century A.D., is dominated for theoretical psychology, in-so-far as there is a theoretical psychology, by the writings of Aristotle and reactions to those writings. In a secondary position are the writings of other classical philosophers, particularly Plato, and those of the Church fathers, particularly Augustine. True the domination is by no means complete and in the case of Aristotle and Plato shows something of a gap in the middle, but one can go a long way in understanding the

theoretical psychology of two thousand years if one understands Aristotle's psychological writings. It should come as no shock therefore to learn that they will be part of your reading assignment.

Phase two

In the seventeenth century we begin a series of theoretical psychologies substantially independent of Classical writers. Leading off with Descartes we find concern particularly with the problems of knowledge (What do you know for sure? How is it that you know it?) and of the relationship between the mind and the brain. These are not of course the only problems of philosophy at the time. There are merely the ones of most obvious connection with psychology. I personally find many of the early positions on these problems inferior to those of Aristotle; however what is more important than their worth is relative independence and novelty. Further these views undergo much development and refinement, so that what emerges at the end of this phase in the late nineteenth century is, in my opinion at least, superior to that which proceeded. By the end of this phase we find a non-experimental consideration of most of the topics of general current interest in psychology, though the emphasis is still somewhat more intellectual than the current one.

During this period there is a fairly strong tendency (with some exceptions) for the beliefs stated to be a function of geography, with England and Scotland disagreeing somewhat with each and particularly with the continent. Perhaps it is a matter of derivative chauvinism, perhaps a result of my sympathy with their political views, or perhaps a consequence of the distortions of translation, but I must confess that I have more respect generally for the British philosophers of mind than for their continental contemporaries--and this despite the fact that for an American psychologist I am relatively rationalistic. Rationalistic, Humm!? it seems a definition is in order. In philosophy, including the philosophy of mind in particular, a rationalist is usually one who maintains that some knowledge comes from reason rather than from sensory experience.

This is in contrast with the empiricist (perhaps better the empirist) who maintains that all knowledge comes from sensory experience. Descartes for instance maintained that we had some innate ideas and that these innate ideas were inherently true. Thus we have ideas with regard to our own existence, the existence of God, and with regard to geometry etc. which we do not have obtain through experience--says Descartes--and which are innately given and true. This makes Descartes a rationalist. In contrast, Locke, a British philosopher writing later in the seventeenth century, maintains that there are no innate ideas, considering specifically the examples and arguments given by Descartes among others and attempting to refute them. This makes him an empiricist. Descartes is followed on the continent of Europe by other philosophers e.g. Spinoza and Leibnitz, who while disagreeing with him on other matters, such has his view of the mind/body relationship, share with him a position of rationalism. Similarly Locke is followed by a string of British empiricists who differ with him on other points but deny innate ideas. Note that this issue of rationalism versus empiricism is very similar to contemporary debates in psychology over innate versus learned accounts of behavior and thought, similar to the question as to how much is instinctual and how much has to be learned. Note further that the geographical correlation still tends to hold, with the English language psychologists, mainly now those of the "colonies," opting for accounts emphasizing learning--Skinner, for example--and the Europeans of the continent tending to emphases more of the innate and instinctual--Piaget, the Gestalt psychologists, the German ethologists, etc. This correlation is a bit weaker now however. Also it should be noted that the debate now though similar to that between rationalism and empiricism is not precisely the same. For the innatist psychologists it is not a question so much of innate ideas as of innate processes and it is particularly not a question of truth: even if an idea were innate, that would not imply to a contemporary psychologist that it was necessarily true.

Within both rationalistic and empiristic philosophy of mind there was development. However, perhaps because of biases outlined above, it seems to me that the British developments were the more important. Particularly in the eighteenth century England and Scotland seem to lead. Following Locke we have developments of empiricism by Berkeley and Hume and perhaps more importantly for psychology we have a development of notions of how ideas might be learned from experience, a development of the concept of associations. Depending on the associationist, associations might be by contiguity or by similarity or perhaps through some other connection. If two ideas (or perhaps things thought of) occurred close together in time, then the occurrence of one of them was supposed to call forth the idea of the other. This is association by contiguity. If two ideas (or perhaps things thought of) were similar to each other, then too, the occurrence of one of them should lead to the idea of the other. Of the less popular laws of association, let me mention association by contrast or opposites: if two ideas (or perhaps things thought of) are opposites, then the occurrence of one should lead to the idea of the other. For instance the idea of a man might lead to the idea of a woman, or that of light should lead to that of dark. One reason that his law was less popular, is that some associationists regarded opposites as a special case of similarity. In the examples I have given, for instance, while a man and a woman may be thought of as opposite, out of all of the objects in the universe there are no others which are more similar than each to each. Similarly, light and dark are alike in being achromatic colors or light levels.

While the laws of association were described by Aristotle and were mentioned briefly by Locke (in the second edition of his Essay, where he describes them as sources of error and confusion in thinking) their major enunciation was by Hartley in the middle of the eighteenth century, thereafter they were accepted in one form or another by English writers of that century and the next. In addition they had some continental support in France and with Beneke in Germany. In Scottish philosophy they were at first anathema, as

being too mechanical and soulless. This was perhaps in part because of their espousal by the great agnostic David Hume. (Hume had in his Treatise indicated that he had failed to find any evidence for a soul; posthumously in his Dialogues Concerning Natural Religion he marshalled arguments to the effect that if there were a God--and at least for the sake of argument if not his personal safety the characters of his dialogue all grant that there is one--there would be no way in which we could be sure of His (Its? Her?) characteristics; nor he also argued would there ever be enough evidence to prove that a miracle had in fact occurred. If this weren't enough from the standpoint of those clergymen teaching philosophy in Scotland, it should be noted that David Hume was in fact a Scot. Later, under the guise of 'suggestions' rather than 'associations', Thomas Brown brought them into the Scottish school as well. In addition Brown presented the laws of secondary suggestion, that is rules for predicting the strength of a particular associationistic connection.

At this point we should note the similarity of the laws of association or suggestion and the views of the twentieth century views of learning. Association by contiguity for instance is very similar to classical, Pavlovian, or respondent conditioning (depending on ones terminological predilections), association by similarity is similar to certain views of mediated generalization, and the laws of secondary suggestion, such conditions as frequency and recency of association, were essentially rediscovered in verbal learning experiments.

Following Brown, it is perhaps more appropriate to speak of British psychology, rather than separately of English and Scottish. Associationism by whatever name continued throughout the nineteenth century in English language psychology on both sides of the Atlantic, particularly in the writings of James Mill, his son John Stuart Mill, Alexander Bain (from the middle of the century to the end--Bain was essentially the first person to concentrate specifically on psychology to the exclusion of other areas) and finally James

Sully. During this period, however, associationism was modified and supplemented by other, non-associationistic concepts, particularly at the hands of Bain.

Meanwhile there is the continent to worry about. The Scottish philosophers were not alone in reacting to Hume's skepticism. The physical geographer Immanuel Kant was jolted from rationalism by reading some of Hume's work and produced a new theory of knowledge which in its modified rationalism implies a psychology of perception and conception which, to my mind, seems more reasonable than any of its predecessors, rational or empirist. Kant, while arguing for some innately given true ideas (notably in mathematics and logic) fucuses on what I would regard as innately given processing: For Kant there are innately given (a priori) categories of understanding or of construing experience. We do not learn for instance to see things in three dimensional Euclidian space, but rather learn to see things, the space itself being given. Similarly the notion of causality is not inferred from experience but rather is innately given in the structure of the mind. The form we have a priori, the content of that from we have through experience.

In addition to this treatment of knowledge, Kant dealt as well with feeling and desire. He is perhaps primarily responsible for the nineteenth century tendency to divide psychology--and its subject matter--into three divisions, cognition (information gathering and processing, understanding), conation (the will, including motivation and action), and motion (including higher order emotions, sentiments, and attitudes). Unfortunately from the standpoint of Kant's psychology in general there are two problems: He is a fairly difficult philosopher to understand, with supposed followers taking quite different positions. And his major work dealing with what we might now regard as social psychology, individual differences, and personality, the very late work he entitled Anthropologie is not only not translated, available only in complete German additions of his works (and too expensive for me), not in our library, but also scarcely discussed in commentaries by philosophers on his work.

A more detailed presentation of this, my second phase of psychology, would of course continue with a consideration of various post-Kantian views on the continent and of the assimilation and accommodation of those views with the British ones. However the major positions have now been outlined with regard to psychology as it viewed in this post Aristotelian, pre-experimental, mental philosophy period.

A Scientific Prelude to Phase three

Phase three is the result of the introduction of the experimental into the study of some of the subject matter of phase two. Thus it is useful for perspective to consider what had been accomplished with that method and with other scientific methods prior to that time. Aristotle, it should be recalled, was a naturalist, an observer of nature and an occasional experimenter. In Alexandria this legacy of method we should recall continued, e.g. in the work of such researchers as Erasistratus. However the readers and commentators of and on Aristotle did not adopt this method. Instead of observing nature and drawing their own conclusions, the 'Aristotelians' of the thirteenth through sixteenth centuries read their Aristotle and other 'authorities' and attempted to reconcile them. There is some use in this, but it certainly implies that one cannot go beyond them. True, as we have indicated, not everyone in those periods did this and some specifically objected to this practice. The most famous objectors and proponents of inductive observation were a couple of Bacons, Roger of the thirteenth and Francis of the seventeenth, but there were others and there were various scientific or technological advances made during these periods. None-the-less, the rate of scientific discovery increased markedly in the sixteenth century and again in the seventeenth. (Perhaps two caveats are in order here however: 1) There is always some danger in saying that any given activity was greater in a more recent century than an earlier one since our records of and understanding of the more recent century are apt to be greater. 2) One must be careful in attributing the views, motivations, and general orientations of a modern

scientist to an earlier one. The early researchers of a scientific sort may have been somewhat unwilling to accept received, written authority, but this is not incompatible for instance with mysticism, a belief in alchemy, astrology, or number magic, with attempts to conjure angles, or for that matter, with holding Christian or other religious beliefs. There is a tendency for instance for modern scientists to belong to liberal churches--if any--but one should not be surprised to learn that Sir Isaac Newton was a Puritan fundamentalist. Ironically it was Newton's discoveries which paved the way for the deism and religious and other liberalism of eighteenth century England, France, and America. But that's another story.

In the sixteenth century we have the astronomical observations of Tycho Brahe followed by their turn of the century codification into laws of planetary motion by Johannes Kepler. Also in that century we find further observational work in the anatomical dissections of artists such as Leonardo and anatomists such as Vesalius, who published in 1543 a general text of human anatomy based on dissection of human cadavers. In the seventeenth century both of these strands were continued. In astronomy, Galileo, among his many achievements, noted the movements of Jupiter's moons by aid of a telescope and used this evidence to suppose along with Kepler and Copernicus that the earth moved around the sun in a similar manner. Later in that century, Newton used his new mathematical developments to show that gravitational attraction among planets and between them and the sun was the same as it was on earth, with the planets perpetually falling toward the sun and, because of an initial sidewise motion, as perpetually missing. Further in that century William Harvey, a Britisher working in Italy at Vesalius's old university, Padua, established the circulation of the blood and the fact that the heart works as a pump. And, finally, Leeuwenhoek described the microscopic.

In the eighteenth century Newtonian physics, the mechanics of moving bodies was further developed, the classification of plants was established on a firm basis by Carl

von Linne (or Linnaeus, who also provided a classification of odors which is still acceptable) and toward the end of the century the nature and classification of the chemical elements was decently begun, though an understanding of chemical compounds, especially organic ones was left for the nineteenth century.

At this point a digression on the relationship between the British associationism and empiricism of the eighteenth century enlightenment and the contemporaneous scientific and religious views seems in order. Newton's success in dealing with moving bodies appears to have had a profound affect on eighteenth century British thought. It first of all along with Harvey's triumph and others I have not named brought to Britain considerable scientific prestige. Secondly, while Newton by no means drew this conclusion, his scientific laws of motion could be used to describe a universe which had no on-going need for a god. In some older views, for instance, one might need divine aid to hold up the planets and stars and keep them moving. With Newtonian universe one could suppose gravitation to be inherent to matter and then have no further astronomical need for a god except perhaps to start the whole thing going. Further the discovery of precise, quantitative laws for motion, together with a belief in atoms or minute particles governed as well by precise, quantitative laws left little room either for miracles or for the power of prayer. To what extent the causal connection is precisely as I've outlined in a little uncertain, however the eighteenth century view of religion popular with the intelligentsia in England, France, and America, deism involved exactly this set of beliefs. It is not atheism because a god is supposed as an initial cause, to set forth the laws of nature and to start the affair going, but it is more than a little at odds with much earlier Christian thought. (An examination of Thomas Jefferson's edited version, non-miraculous version of the bible might be enlightening in this regard.)

For the mental philosophy of Britain as well is the influence of Newton's laws important. If the physical world consists of bouncing bodies obeying laws of motion and

attraction, might not the mental world be likewise? In British associationism there is more than a little presumption of this, with ideas being the bodies and the laws of association replacing gravity as the force of attraction. This is perhaps most clear in Hartley, however it is present to some degree in Locke as well.

Perhaps a consequence of deism, perhaps unrelated, but in any case to be noted is a strand of liberalism associated with the British empiricists and associationists from Locke to John Stuart Mill and with certain eighteenth century Americans who were influenced by Locke as well, notably Jefferson. The concepts of freedom, liberty, and religious tolerance built by Jefferson into the Bill of Rights are very much an out-growth of some other sides of Locke's thinking. Finally it should be noted that from Hume on, this school is connected with classical economics and with Utilitarianism. But I must cease my digression.

In the nineteenth century we find a greatly expanded theater of scientific advance, particularly in Germany. In the early nineteenth century we have the Wöhler synthesis of urea. While Wöhler was not the first to perform such a synthesis, his ability to do so outside of his body suggested that the chemistry of organic compounds could be studied as well as that of inorganic and that it was not necessary to have life or some sort of vital principle in order to produce such compounds. We find further advances in other parts of chemistry and while these are too many to name--this is chemistry's great century--we should especially note Mendeleev (several alternate spellings occur) promulgation of the periodic table of the chemical elements. With this table Mendeleev showed that the chemical properties of the elements depended on their atomic weights (It actually depends on their atomic numbers, but the relationship is close.) and from gaps in his tables was able to predict the existence of three elements in 1871.

Within biology we should particularly note the physiological advances of the early nineteenth century because of their relevance to later psychology. Within neural

philosophy and the physiology of the sense organs there was especially relevant research. Bell in England and Magendie in France independently discovered the so-called law of spinal roots, namely that the nerves from the front of the spinal cord were motor nerves, that is that they stimulated the muscles and the glands, and those attached to the back of the back of the spinal cord were sensory ones. This division of function was carried one step further by Johannes Müller (though Bell had anticipated him) in his law of specific nerve energies. Although this law has several parts, some of which we now know to be wrong, the central truth of his observation is that each sensory nerve is associated with a specific kind of experience, so that regardless of how you stimulate the optic nerve, say, the experience is a visual one. (This law should be kept in mind for this probably later great influence on phase three psychology.) Somewhat later, one of Müller's students, the profoundly impressive Hermann von Helmholtz (Referring to Helmholtz as 'one of Müller's students' is a bit like calling Freud one of Helmhotz' research assistants.) established the speed of conduction of nerves and mapped out the workings of the eye and of the car. He also made important contributions of the concept of conservation of energy, but that's another story. The speed of conduction for nerves had been disputed prior to that time with some thinking it to be instaneous and others at or greater than of light. Helmholtz determined that in fact nerves conducted at about the speed we associate with automobiles on the freeway--some are Ferraris, other Fiats, but they are all in roughly that range. As for his sensory research, while his theory of the working of the inner ear turned out to be wrong, his theory as to the receptors of the eye has been supported and the statements which he presented as fact rather than theory are generally correct.

Finally, among scientific advances influential for phase three psychology we must mention the theory of evolution. While the idea that species of animals and plants might gradually evolve and change had been in the wind since the late eighteenth century, a

fairly accurate theory as to how evolution occurred together with massive documentation that it did occur was left primarily to Charles Darwin. In 1859 he published his The Origin of Species having earlier outlined the theory in a joint memoir with Alfred Wallace. (Wallace had independently come to the same conclusion though with less documentation.) In the Origin, Darwin studiously avoided discussion of human evolution, presumably in order to reduce the amount of controversy. Having weathered the initial controversy, however he published two other books, The Descent of Man, in which human evolution was outlined, and The Expression of Emotions in Man and Animals, in which the evolutionary connection between humans and other primates was assumed and further supported through a documentation of behavioral similarity.

The controversy over Darwin's views was of course profound. Primarily this controversy stemmed from the incompatibility of Darwin's findings and claims--particularly in the Descent--with those in the book of Genesis, at least as literally interpreted. Many clergy at the time reacted as most would probably today, that Genesis was not to be taken all that literally and that they saw no problem with a God who worked through evolution to create man and the other creatures. Taking the 'days' of Genesis as epochs, they would note that even according to Darwin, man was late to come on the scene following after other major classes of creatures. Others didn't see it that way and Darwinism was roundly debated, sometimes legally banned, and by no means always accepted even among biologists. It was also often misunderstood even among its supporters. The concept of 'the survival of the fittest' for instance was used as an excuse among 'social Darwinists' to justify the inferior treatment of 'inferior' peoples--in the nineteenth century England of the Empire this must have been a comforting notion. (Actually the phrase might better have been 'the survival of the survivors'--natural selection is simply of those individuals which happen to survive to the extent that they produce offspring which survive to the extent that they produce offspring which... . There is not other sense in

which the survivors are particularly 'fit'.)

As for the theory of evolution itself, it's fairly straight forward, at least in outline. Evolution requires three main ingredients: 1) Variation of characteristics within the members of population. 2) Some degree of tendency for the offspring of members of that population to be similar in characteristics to their parents. 3) A differential tendency to have surviving offspring as a function of having particular characteristics. Consider the proto-Giraffe: Among ancestors to the Giraffe there would have been, as there is within any species, some variation in neck length. This provides the first ingredient. Presumably the longer-necked proto-Giraffes would tend to have somewhat longer necked offspring--at least that's usually the case--providing the second ingredient. Finally, if we have a situation where the proto-Giraffes are making their living by eating the leaves from the lower branches of trees, all we need is a scarcity of leaves vis-a-vis proto-Giraffes in order to produce the evolution of longer necks. Those proto-Giraffes at any point in time that had the longest necks would get the most food and, other things being equal, would tend to produce the most proto-Giraffelets, leading to an increase in the average length of neck. This would escalate the competition for leaves even higher, leading to a differential advantage of having even longer necks. Eventually in this manner the species would evolve into Giraffes. Note that another group of proto-Giraffes isolated from the first and relying on a different food supply would not evolve in the same way and would end up as a different species.

We have now surveyed the main scientific events important for the creation of a scientific (?) psychology. There were many other scientific developments of course, but they don't strike me as so important in determining the shape of phase three psychology as the ones I've described. From beginnings in astronomy, physics, and descriptive biology, science had grown by the time phase three psychology was being started, to include chemistry, with its catalogue of the physical elements, and a substantial study of life,

both in its physiology and in its evolutionary development. Is it any surprise, then that in the late nineteenth century the experimental methods of the physiologist, already being used in the study of the nerves and the sense organs, would be brought to bear on the traditional problems of psychology and mental philosophy?

Phase three

Phase three psychology may be said to have begun on October 22, 1850 at about 10 A.M., G.M.T. It may also be said to have begun somewhat later than that, at about 1874 or 1875 or even later. At one time it was said to have begun in 1879, but according to more recent research that seems unlikely. Alternately it may have begun even earlier. On October 22, 1850 Gustav Theodor Fechner was sleeping in, or to be more accurate, he was lying in bed thinking, as was his wont, and had an idea. Fechner had been concerned about the relationship of the mental and physical, particularly the relationship of the brain and the mind, that is in his terms, 'inner psychophysics'. The idea he had was precisely related to that, but rather concerned 'outer psychophysics', that is, the relationship between the external physical world and our experience of it. He decided that the mental was the logarithm of the physical. For those who have forgotten their logs, perhaps I should point out that this implies that as there is an increase along some physical dimension, amount of light, say, or number of beans, there will be an increase in our perception as well, of brightness or numerosity, but that the psychic or mental, the perception, will increase less rapidly than the physical increase. More quantitatively, it also implies that a constant proportion of increase physically should lead to a constant unit of increase subjectively. Thus if going from 1 light bulb to 10 light bulbs leads to a particular amount of change in brightness, then going from 10 to 100 light bulbs should lead to the same amount of brightness change. Enough already. What is probably more important than the law that Fechner proposed is that he then had to develop methods for seeing whether it was true (It quite often is a good approximation.) and in

the process stimulated the experimental study of sensory experience. Thus the case for October 22, 1850.

Another case for the 1850's as a beginning could be made. It was during this decade that Alexander Bain published the first edition of his main work. Though this work is primarily observational and 'arm-chair' rather than experimental, and though Bain did not himself do any experiments of which I am aware, in his two big books, The Senses and the Intellect (1855) and The Emotions and the Will (1859) Bain included and attempted to integrate physiological research of relevance to psychology. While various hypothetical brain processes crop up from time to time in books of mental philosophy or psychology, it appears that Bain was the first include the results of physiological experimentation on the senses, nervous system, etc.; perhaps his is phase 2.9.

1874 or 1875 marks the date or dates of the first two laboratories set aside for psychology, Wilhelm Wundt's at Leipzig and William James' at Harvard. Both dates are somewhat uncertain and it is difficult to determine priority. Wundt was a physiologist who took an appointment as a philosopher, and experimental philosopher of psychology to be exact. Since he did more research, founded a journal, and trained more students, Wundt is usually given the nod. 1879 was an earlier estimate, that is an estimate made earlier, for the founding of Wundt's lab.

Early Phase three: Wundt, Titchener, et al; Structuralism

Charts of academic pedigrees for early phase three psychologists make the influence of Wilhelm Wundt obvious. Copies of such charts were prepared by Ben-David and Collins (1966). They were constructed by culling names from 5 standard texts of psychology, 2 American and 1 each from France, England, and Germany. Wundt trained more than twice as many students in the period prior to 1900 than his next nearest rival, G. Stanley Hall, with Georg Müller being third. Tables of publications and references from Ben-David and Collins document the early preeminence of Germany in phase three psychology, though of

course not any personal preeminence for Wundt. According to Boring, Wundt's daughter published a bibliography of over 500 of his works. Boring further estimates Wundt's published pages in books alone to exceed 13,000, with the total of all pages, including revised editions, 53,735.

As to the nature of the problems studied at Wundt's lab, Boring is again probably in the best position to advise us. He indicates (1950, pp. 340 ff.) that about a third of the research dealt with sensation, and that if perception were added, the two areas would constitute more than half of the total. In third position he says was the problem of action, particularly that of reaction time--with this being about a sixth of the total. Other topics he mentions are feeling and attention (about a tenth) and scattered studies on association, and memory. The pages devoted to these various areas in Külpe's Grundriss of 1893 show similarly proportions. (Külpe's book is relevant here because at the time he was writing he was a Dozent under Wundt, dedicated the book to him, and attempted to summarize experimental work only, ignoring all speculation whether left over from phase two or of new origin.)

In addition to this laboratory work, Wundt wrote on (other?) philosophical matters and, in the last twenty years of his life wrote a ten volume work of library anthropology, the Völkerpsychologie. This 'Folk Psychology' was not so much a social psychology as an attempt to understand the higher mental processes through their development. He did not believe that the experimental method would suffice to understand these processes. On the other hand he had the view, more common among anthropologists then than now, that so-called 'primitive' people were primitive in all respects culturally, rather than in technology and/or economic base alone (or primarily), and that they were simply at an early cultural stage through which the 'more advanced' people had passed earlier. Given this notion of essentially single line development (It isn't really that simple.) Wundt's enterprise must have been tempting.

Wundt's systematic views as to how mental processes went on were not all that thoroughly worked out, but show a strong resemblance to the views of the later British Associationists. He regarded the subject matter of psychology to be the immediate contents of experience, believed that content to be generally composite in nature, and maintained that there were three main problems "to be solved in succession. The first is the analysis of composite processes; the second is the demonstration of the combinations into which the elements discovered by analysis enter; the third is the investigation of the laws that are operative in the formation of such combinations." (1907, p. 28, emphasis in original) The 'elements' of Wundt were the (pure) sensations and the (pure) feelings. A pure sensation, a sensory element, has for Wundt a rather limited repertoire, that is it can vary only in such dimensions, in the case of vision for instance, as brightness, hue (red, orange, yellow,...), and saturation (purity). Feeling elements, at least in his later work, have three dimensions, agreeable/disagreeable, exciting/quieting,and tension/relief--if you are having trouble telling the last two apart, don't worry, so did some of Wundt's followers. As for the laws of combination, these are somewhat similar to the laws of association. However it should be noted that Wundt emphasized laws for simultaneous combination of elements as well as ones which called forth chains of associations and that he believed that when the elements were combined they might be in some sense transformed, this particularly in the case of simultaneous combination. Thus when several tones were presented at the same time, while the elements corresponding to each would still be present and capable of being discovered by analysis, the overall idea of the clang would be different from the sum of the elements, because fusion would take place.

The idea that one should--and could--work out some sort of classification of the contents of mind, or the mental events, was not unique to Wundt, but was almost universal among psychologists of this period. The belief in mental elements, particularly sensory

ones, was less wide spread, but still very common. I think that we must consider some background to the thought of the time. We may recall that Locke in the late seventeenth century writing shortly after Newton appeared to see his task in the mental world as somewhat similar to Newton's in the physical. More explicitly in the middle of the eighteenth century, Hartley assimilated the laws of moving, bouncing bodies, 'vibrations' to those of mental association, with mental elements bouncing around, appearing and disappearing, attracting and repelling each other. Wundt--and likewise John Stuart Mill and Bain--on the other hand, were writing after the development of chemistry, with a knowledge or at least a strong suspicion that while there was a potentially unlimited number of chemical compounds, there was but a finite and small number of chemical elements. Further the chemists had made considerable progress in determining the laws of combination of the chemical elements. The contents of mind, the myriad different mental events, were too many and varied to list. This implied that some sort of classification was necessary if the science of mental life were to succeed. One such classification might be, if the mental were like the physical, in terms of mental elements and their chemistry. That Wundt had this motivation and model I can find no direct evidence. J.S. Mill however referred to his belief in the existence in mental elements which exhibited new and different properties when compounded as 'mental chemistry'.

As for the belief in sensations as the primary mental elements, I belief this may have had an additional source. While Wundt rejects the law of specific nerve energies in its strong form (1907, pp. 47 ff), he does so in a way which would, I believe, lead him to similar conclusions. Wundt states the law of specific nerve energies as follows: "every receiving element of a sense-organ and every simple sensory nerve-fiber together with its central terminus, is capable of only a single sensation of fixed quality; that the various qualities of sensation are, therefore, due to the various physiological elements with their different specific energies." (1907, p. 47) Now it should be noted that if the

first half of the law is true--that portion prior to the semicolon--we are forced to include sensations as elements, though we are not forced to restrict our categories of elements to them or to them and the feelings. While I have some difficulty following Wundt's arguments against the law, it seems to me that they are primarily against the second half of it rather than the first. In any case, Wundt concludes his discussion with the observation that "An interrelation between sensations and physiological stimuli must necessarily exist, however, in the sense that different kinds of stimulation always correspond to different sensations. This principle of the parallelism of changes in sensation and in physiological stimulation is an important supplementary principle in both the psychological and the physiological doctrines of sensation." (1907, p. 50) From this I assume that Wundt, while rejecting the law, accepts enough of it as to make him believe that the primacy of sensations as mental elements has a necessary basis in physiology.

Having devoted this much space and time to Wundt, I am happy to say that in broad outline his views and approach were shared by many in the period prior to 1910. Edward Bradford Titchener, his British student who came to America for instance championed similar views until his death in 1927. In 1896 for instance, he even produced a list of the number of different elementary sensations for each sense, raging from 32,820 for the eye to 1 apiece for several senses. Similar views were held as well by the German psychologist who was probably second in importance to Wundt, Georg Müller, though Müller was less concerned in producing an overall system. Also, where Wundt talked about the laws of combination but rarely studied them, Müller produced some 5 hefty volumes on memory and memorization wherein he studied both what his subjects said as to how they organized the material and the more objective results in performance of different kinds of organization. (This was following Ebbinghaus's pioneering work on memory where he, surprisingly considering the times, concentrated on accuracy of memory, pretty much ignoring introspection.) Because of Müller's interest in organization, particularly in

his later years, the similarity to Wundt is only partial. He may alternately be seen as a way station to Gestalt psychology (see below).

In greater opposition to Wundt's elementism, and that of the British Associationists, were several non-experimental psychologists of the late nineteenth century. Brentano, for instance, believed in attempting to catalogue the mind, but his was a catalogue of 'acts' rather than contents. His three main classes are ideating (including sensing, imagining), judging (including even such low-level judgments as that one perceives or recalls something), and loving/hating (including acts with a willful component such as desiring or intending). Somewhat similar views were also held by others. However such concepts were not so easy to experiment upon as the sensations and their relatives (or at least the sensations!) and as the hall mark of the new psychology was experimentation, rightly or wrongly such views and had little influence.

Finally, it was possible to accept Wundt's elements and general system while adding to the list. This position occurred in the so-called Wurzburg School in the period from 1901 on. There, in a series of experiments performed under Oswald Külpe--the author of that Grundriss of 1893 we considered before and a student of both Müller and Wundt--new elements and organizing principles were proposed. The Wurzburgers felt that they had found thoughts which involved none of the older elements. Because Titchener felt that there were three classes of elements, sensations, feelings, and images (where the images were but memory copies of Wundt's sensations and acceptable), the Wurzburg position was known in this country as one of positing 'imageless' thought and the debate is called the 'imageless thought controversy'. As a sample, suppose you are told that you are to be given two numbers and that you are to add them. In the period between the instructions and the numbers, the Wurzburgers maintained that while you might at first have some imagery of the instructions you would after a bit have no relevant sensations, images or feelings--relevant that is to the solving of the problem. Yet, they maintained there was

some sort of awareness, an attitude of consciousness, setting one to solve the problem. The truth or falsity of this notion aside, it provoked from Wundt a polemical reaction that the experiments themselves were improper--for various reasons that seem to me to apply to his own as well--a strong, but more moderate reaction from Müller, and from Titchener an attempt at replication, without finding any new elements. Actually I suspect that Külpe and Titchener could have been reconciled, in that I believe them to have disagreed as a function of terminology. Historically however, the issue was never resolved.

Functionalism

After Titchener came to the United States to head the laboratory at Cornell in 1892, he began to encounter people who called themselves psychologists and who did experiments, but departed in various ways from Wundtion orthodoxy, to a greater extent in fact than the Wurzburgers were to in the immediate future. In a pair of papers in 1898 and 1899 he attempted to outline his position, what he took their position to be, and why his position was to be preferred. In those papers he coined the terms 'structuralism' and 'functionalism', referring to his own position and that of Wundt (I suspect that Müller and the Wurzburg school would have met the criteria as well) as structuralist. He maintained that the structuralist was concerned with mental content and events and with their classification; the functionalist, with the change of mental events over time, with process. Comparing psychology, with biology, he suggested that structuralism was similar to morphology (anatomy) and functionalism was similar to physiology, noting that morphology was historically, and to some extent logically, prior to physiology. Similarly, in psychology one cannot study process without first studying content. In addition he indicated that 'function' was used as well by certain psychologists in other senses, though he does not describe them in sufficient detail or me to be clear as to what the other senses were.

What strikes me as the most important way in which functionalism was 'functional', though processes were emphasized, was in terms of evolutionary function. With Darwinism in the late nineteenth century air--particularly in Britain and America--it is perhaps not surprising that some psychologists would concern themselves with the survival value, or evolutionary function, of mental events, processes, and behavior. This sort of concern appears in Bain's post-Darwin revisions of his works; but it is not a systematic, throughout revisions, being introduced piecemeal. It also occurs in the writings of Spencer, though his evolutionism is not Darwinian. However, neither of these authors is ordinarily regarded as a functionalist. William James on the other hand is often, if not always, placed in the functionalist camp--and is generally regarded as a major influence on the functionalists by those who do not place him among them. In this mammoth (1400 pages) Principles of Psychology of 1890, James takes Darwinian evolution for granted--see particularly the sections on 'mind-dust' and on instincts--and on quite a few occasions discusses the functions or uses of various processes--note particularly the passage on the function of consciousness and on habit as the 'enormous fly-wheel of society'.

James' Principles were written before Titchener made the structuralist/functionalist distinction and by the time it was made his interests had turned away from psychology--the psychology of religion aside--so that so far as I am aware he never broached in print the question of whether he was a functionalist. John Dewey and James Rowland Angell, both at the University of Chicago, writing somewhat later, accepted Titchener's label for their approach. In his 1904 Psychology and even more clearly in his 1906 presidential address before the American Psychological Association, Angell outlined what he meant by functional psychology. He saw the functionalist as interested in mental processes or 'operations' as opposed to the structuralist's attempt to catalogue the elements--if any--of consciousness, "but also more and more vigorously in mental activity as part of a larger stream of biological forces.. . The psychologist of this stripe is wont to take his cue

from the basal conception of the evolutionary movement; i.e. that for the most part organic structures and functions possess their present characteristics by virtue of the efficiency with which they fit into ... the environment." (1906, p. 504)

From the evolutionary concept of function, 'usefulness' for species survival it is easy, perhaps too easy, to pass over to questions of individual purpose in motivation, and as well to questions of useful psychology--of applied psychology. From the idea of species development and the evolutionary interest therein it is likewise easy to extrapolate to individual development--particularly given the notion popular at the time that 'ontogeny recapitulates phylogeny', that the individual in developing goes through the same stages as did the species in its evolution. Lest this last notion appear too bizarre, let us note that the human embryo at one stage develops gills and then loses them, that even until fairly late stages mammalian embryos essentially all look alike, and that the human infant does begin its post-womb existence as a languageless quadruped! More obviously an interest in mind and behavior from the standpoint of evolution practically dictates some concern with animal psychology. Whether for these reasons or others, it was the case that functionalism was more sympathetic than was structuralism to these areas of motivation, applied psychology, child psychology, and comparative or animal psychology, though this should not be taken to imply that workers in these areas were necessarily functionalists.

Nor should we suppose either that the impact of evolution was confined to functionalism or that in terming, e.g, William James a functionalist we have said all that there is to say about him. The most obvious case of a non-functionalist influenced by Darwin was his cousin, Sir Frances Galton. While it would be impossible to peg Galton with the narrow category of 'psychologist' let alone 'functionalist' he did research relevant to psychology, research prompted by elements of the theory of evolution. You will recall that in discussing Darwin's views I presented as the first two 'ingredients'

of evolution, a tendency for those characteristics to be at least partly inherited. Galton studied such variation and its inheritance (among other things!) in the members of his own species. He studied the variation among his countrymen in performance on assorted simple psychological tasks such as tests of sensory acuity, in strength of imagery, in physical dimensions etc. Much of this data he gathered for free, or perhaps even at a slight profit, by charging people to be measured. He also carried his measurement of physical dimension abroad as well. In at least one case of the latter, he secured his measurements despite local taboos forbidding close contact with strangers by the use of surveyors' equipment! Galton's study of the inheritance of characteristics was somewhat less extensive and was marred in the case of his study of the inheritance of 'genius' by a considerable ignorance of important environmental effects. None-the-less in the process of studying inheritance, he developed novel statistical techniques for describing the amount of relationship between two groups, such as, for instance, the relationship between the heights of parents and that of their children. The so-called Pearson product moment correlation coefficient is essentially a refinement of Galton's technique. Following Galton and often inspired by him, we have seen the growth of extensive research into individual differences of a psychological sort. It is doubtful, however, if very much of this was done for Darwinian reasons.

I cannot conclude a section which includes William James without saying more than that he was influenced strongly by Darwin. James is almost a folk hero in American psychology. While it is doubtful if many contemporary American psychologists have read all of the Principles, they seem to have heard of him, to have a notion of at least one of his ideas, and for the most part to regard him as a great psychologist; perhaps the greatest America has produced. And this despite the fact that they often can give little reason why. I suspect some aspects of the James cult may have little to do with his psychological views. The personal James is relatively interesting to write about for instance--you might

compare the amount of discussion of James' life with that of others in standard histories. His brother, Henry, was an important American novelist, perhaps the most important of his time. Both Henry and William moved in, and were respected in, European circles at a time where American intellectuals tended to consider themselves to be culturally deprived. Further, where the other American psychologists of the time generally had to be trained in Europe (note the Ben-David and Collins charts again), James was largely self-taught in his psychology--his actual degree was in medicine. Perhaps as well there is appeal both in the lateness of his success--he was 48 when the Principles was published--and in his still later success as a philosopher. (He was jointly responsible with Charles Saunders Peirce and with Dewey for the pragmatist school.) The undistinguished latter day psychologist may like to think of James in order to tell himself that all he needs is time; after all, William James was a slow starter, wasn't he? And then, finally, the James family wrote and kept large quantities of letters, all in English, making intellectual biography relatively easy.

But there are reasons within the Principles for seeing James and his psychology as important. One such reason is also a reason why even those psychologists who have read the Principles have difficulty saying why it is important: It is unsystematic. Where other psychologists might give you a well organized, internally consistent set of views, a set of views that are therefore easier to characterize briefly, James ranges over a wide variety of topics, considering the views of others, debating with them and with himself, adjudicating disputes, and often withholding judgement. Thus for instance on the question of evolution, though I know from biographical sources that James favored the Darwinian position, I don't learn this from James until the end of the second volume. Evolution is first discussed early in the first volume of the Principles, but at that point he indicates that it doesn't matter for the topic under discussion which of several rival evolutionary theories one holds. He doesn't bother to take a stand until it is necessary,

some 1200 pages later. Now this relative lack of system may make James's views difficult to summarize, but it also makes it less likely to be wholey wrong. For an author of a tight little associationistic system, for instance, if the doctrine of associations is wrong, then so in large measure is the system. If Wundt's concept of sensory elements is wrong, so is much of his systematic thinking. With James we have a wealth of concepts worked out in various detail and several can be wrong without affecting so much the others. One novel view of James concerned emotion. The so-called James-Lange theory of emotion (C. G. Lange expressed a similar view at the same time) is that the bodily states we think of as resulting from emotion are in fact its cause: "we feel sorry because we cry, angry because we strike, afraid because we tremble." (1890, p. 450) At one time this was thought true; later, research seemed to disprove it; currently a compromise view of containing part of James' and Lange's notion is in vogue. Meanwhile, other portions of the Principles were unaffected by these changes in status.

While James and the later functionalists regarded a wider range of topics as appropriate for psychology than did the structuralists, it would be a mistake to expect modern proportions in their texts: Theirs was still primarily a cognitive psychology, a psychology of sensation, perception, and thinking. The proportions of the other two traditional areas of mental philosophy, emotion and will, were smaller than in Bain's work and only a small amount of material not fitting that traditional division was added. In the Principles this added material dealt with neural physiology, habit, the mind/brain relationship, attention, hypnotism, and perhaps most importantly, a chapter on the stream of thought and one on the consciousness of self. In the stream of thought chapter, James attempted to describe that stream without any preconceptions that it ought to consist, say, of mental elements compounded through associationistic fusion, or of Brentano's ideating, judging, loving/hating, for that matter. Of the elements specifically, James felt he found no evidence. Consciousness he felt showed continual change, though with

continuity rather than with complete abruptness. While consciousness had its relatively stationary substantive moments, even these showed change and they were in any case connected by more transitive states, feeling of relation, of tendency, of sequence and so on. He remarks "As we take, in fact, a general view of the wonderful stream of our consciousness, what strikes us first is this different pace of its parts. Like a bird's life, it seems to be made of an alternation of flights and perchings." (1980, v. I, p. 243)

The consciousness of self chapter is largely devoted to conceptual analysis, to an examination of the many different 'selves' of an individual. While a concern for self or selves tended to drop out of psychology after James--psychoanalysis aside--there was a small stream connecting this chapter of James' with the broader flow of self theory in contemporary personality theory.

Behaviorism: J.B. Watson, his followers and predecessors

Functionalism with its emphasis on the survival value and evolutionary origin of mental and behavioral process not only made for an increase in interest in animal psychology, it also made it possible to do psychology without asking subjects, human or animal, as to their mental events. For a functionalist, such a psychology of behavior alone would be an incomplete psychology, but it would at least be psychology. For a structuralist a study of behavior--as opposed to a use of behavior to infer mental events--would simply not be psychology, but some variety of biology, perhaps allied to physiology. Perhaps the greater degree of broadmindedness in this regard was fatal to functionalism.

John Broadus Watson received a Ph.D. in psychology at Chicago--and you will recall that that University was the citadel of functionalism after James--with his dissertation being based on physiological and behavioral research on the white rat. Ten years later in 1913 after continued animal research he produced an article arguing that structuralism has

not fulfilled its promise that the introspective method is at fault, leading to hopeless deadlocks of disagreement, and that the mentalistic functionalists are little better. At one point he seems willing to compromise, saying that either behavioral data must be admitted to psychology for its own worth--without the detour of having to infer from the behavior of a human or other animal what its mental state was--or, alternately we must develop a strictly behavioral psychology. However by the end of the article Watson is definitely committed to the latter approach;

> The psychology which I should attempt to build up would take as a starting point, first, the observable fact that organisms, man and animal alike, do adjust themselves to their environment by means of hereditary and habit equipments. These adjustments may be very adequate or they may be so inadequate that the organism barely maintains its existence; secondly, that certain stimuli lead the organisms to make the responses. In a system of psychology completely worked out, given the response, the stimuli can be predicted; given the stimuli the response can be predicted. Such a set of statements is crass and raw in the extreme, as all such generalizations must be. Yet they are hardly more raw and less realizable than the ones which appear in the psychology texts of the day. (1913, p.l 514)

After giving an example of some of his own research on the behavioral adjustments of some birds, and a statement that he would have proceeded in the same manner had he been studying Australian tribesmen or the educated European'--though he concedes that the latter in particular would have required more time than did his birds--Watson concludes,

> In the main, my desire in all such work is to gain an accurate knowledge of adjustments and the stimuli calling them forth. My final reason or this is to learn general and particular methods by which I may control behavior. (1913, p. 515)

From the references to adjustment, particularly hereditary adjustment, Watson's debt to has functionalist teachers should be clear. Even the somewhat ominous last line echoes the functionalist's sympathy with applied psychology.

A year later, in his Behavior: An Introduction to Comparative Psychology, Watson again offers compromise coupled with threat:

> It seems reasonably clear that some kind of compromise must be effected; either psychology must change its viewpoint so as to take in facts of behavior, whether or not they have bearing upon the problems of "consciousness;" or else behavior must stand alone as a wholly separate and independent science. Should human psychologists fail to look with favor upon our overtures and refuse to modify

> their position, the behaviorists will be driven to use human beings as subjects and to employ methods of investigation which are exactly comparable to those now employed in the animal work. Any other hypothesis than that which admits the independent value of the behavior material will inevitably force us to the absurd position of attempting to construct the conscious content of the animal whose behavior we have been studying. (1914, p. 3)

Again, however, he proceeds to argue that introspective psychology has given us little but disagreement and again he outlines a program for a psychology without mental events. In addition he chooses allies:

> What makes us most hopeful that the behaviorist's position is a defensible one is the fact that those branches of psychology which have already partially withdrawn from the parent, experimental psychology, and which are consequently less dependent upon introspection, are today in a most flourishing condition. Experimental pedagogy, the psychology of drugs, the psychology of advertising, legal psychology, the psychology of tests, and psychopathology are all vigorous growths. These are sometimes wrongly called "practical" or "applied" psychology. Surely there was never a worse misnomer. In the future there may grow up vocational bureaus which really apply psychology. At present these fields are truly scientific and are in search of broad generalization which will lead to the control of human behavior. E.g., we find out by experimentation whether a series of stanzas may be acquired more readily if the whole is learned at once, or whether it is more advantageous to learn each stanza separately and then pass to the succeeding. ...

The degree of vigor of these areas vis-a-vis experimental psychology at the time could be debated--the best answer would probably come from a journal article count comparing relative numbers of publications.